These matings were highly fertile. Reciprocal crosses, however, were achieved only with difficulty and were almost completely infertile—95·8 per cent of the eggs did not develop and the few larvae which emerged died in the first instar (Table 5).

Backcrosses of *m g* males with *globocoxitus* females were likewise highly infertile: 85·6 per cent of the eggs failed to develop. However, in this cross, although most of the larvae died in the first instar, a few yielded adults. In crosses between *molestus* females and *m g* males, there was some reduction in fertility, but backcrosses involving *m g* females with *molestus* males were highly fertile. The larvae from these crosses were vigorous and developed normally.

TABLE 5.

Crossing between C. globocoxitus *and Other Members of the* C. pipiens *Group.*

| Female. | Male. | Number of | | Percentage Hatched. | Percentage Unhatched. | |
		Egg Rafts.*	Eggs.		With Embryo.	Without Embryo.
molestus	*globocoxitus*	23	1448	98·6	0·1	1·2
globocoxitus	*molestus*	6	435	1·3	2·8	95·8
mg	*mg*	16	1267	60·6	7·9	31·5
mg	*globocoxitus*	8	509	86·4	7·6	6·0
mg	*molestus*	13	1126	89·3	2·3	8·4
globocoxitus	*mg*	9	659	5·5	8·9	85·6
molestus	*mg*	14	781	74·8	4·5	20·7
fatigans	*globocoxitus*	12	936	91·1	1·0	7·9
globocoxitus	*fatigans*	1	79	0·0	0·0	100·0
fg	*fg*	9	743	95·4	1·6	3·0
fg	*globocoxitus*	11	689	89·4	1·4	9·2
fg	*fatigans*	6	402	94·3	0·4	5·4
globocoxitus	*fg*	2	128	0·0	0·0	100·0
fatigans	*fg*	11	743	88·1	0·3	11·6
australicus	*globocoxitus*	13	870	99·1	0·2	0·7
ag	*globocoxitus*	5	335	96·1	0·3	3·6

* All the females were fed on human blood.

Rather similar results have been obtained in crosses between *C. globocoxitus* and the two remaining members of the *C. pipiens* group. Although *globocoxitus* males show a strong, or total, preference for intra-specific mating, they will, in the absence of choice, mate with females of *fatigans* and *australicus* (Table 4); these matings are highly fertile.

Reciprocal crosses with *fatigans* are totally infertile; in such crosses there is almost complete sexual isolation. In an experiment repeated seven times, ten *globocoxitus* females were caged with 30–50 *fatigans* males for periods of up to seven days; in all, only one female was fertilized and her eggs failed to develop. Backcrosses were fully fertile except those involving *globocoxitus* females which were completely sterile. Many of these crosses, however, were difficult to achieve; *m f* males did not readily mate with *m f* females, and only exceptionally with *globocoxitus*; *fatigans* males tended to ignore hybrid females, and, even when no choice was given, only six out of fifty were inseminated. In the corresponding experiments with *molestus* the males did not make any distinction between hybrids and their own females when caged together.

Experimental crosses between *globocoxitus* and *australicus* were restricted by the fact that *australicus* itself, and *a g* hybrids, are eurygamous. The two possible crossings were fully fertile.

These experiments have demonstrated three levels of fertility between members of the *pipiens* group:

1. Reciprocal crosses and backcrosses, fertile—most strains of *molestus* and these strains with *fatigans*.

2. Reciprocal crosses and backcrosses of hybrid males to paternal stock, abortive— *Me* strain of *molestus* with most other strains and with *fatigans*.

3. Reciprocal crosses and backcrosses of hybrid males to paternal stock, sterile— *globocoxitus* with *molestus* and *fatigans*.

Discussion.

For the old school of taxonomist, the species was a static conception based on the degree of morphological distinctness. The study of geographical variations, however, has shown that some well known "species" are actually groups of species indistinguishable morphologically. Morphological definition is satisfactory for the monotypic species, but it is clearly inadequate for the polytypic.

In modern taxonomy, the species is a dynamic conception; it is the product of the evolutionary process, and its definition is based on reproductive isolation of natural populations. This was formulated by Mayr (1942) as follows: "Species are groups of actually, or potentially, interbreeding natural populations which are reproductively isolated from other such groups." It is only in such isolation that new forms can develop.

Of various isolating mechanisms, the most important is sexual isolation; between species this is usually complete; between races or strains of the same species it is absent, as a rule. If two or more closely related forms are found in the same area, without the occurrence of intermediates, they must be sexually isolated and therefore must be distinct species. If two populations occupy neighbouring geographical or ecological areas, and produce intermediates where they overlap, they are treated as subspecies.

From the nature of the problem it is impossible to provide a definition of species which will cover all cases and Mayr's cannot always be applied rigidly. We know, for example, that *globocoxitus* and *molestus* are, as a rule, ecologically isolated (see below). Occasionally, however, they utilize the same breeding sites and they may then interbreed. Previously only a few hybrids had been collected (Dobrotworsky, 1953), but in 1953 and 1954 a permanent breeding place of *globocoxitus* was found to harbour also *molestus* in the winter; during the period of joint occupancy, hybrids were very common; they were absent during the summer. In the absence of a permanent population of intermediates, *globocoxitus* must be regarded as a distinct species.

In many cases, interbreeding in nature between closely related forms may be difficult to detect, particularly if they are similar morphologically. The first approach must then be through laboratory crossbreeding. The results of such experiments are not necessarily conclusive, since the conditions differ from those in nature, but they may contribute to the solution of difficult taxonomic problems; they also provide the information necessary for an analysis of mechanisms which determine the degree of reproductive isolation.

For the Australian members of the *pipiens* group these mechanisms are:

1. *Ecological isolation.*—*globocoxitus* and *australicus* are ecologically isolated from *molestus* and *fatigans*. The first two are rural mosquitoes breeding mainly in clear ground water and swamps; the second two usually occur in the vicinity of human dwellings, and breed in ground pools of artificial containers, with a preference for polluted water. This isolation is not complete because *globocoxitus* and *australicus* sometimes breed in suburban sites in company with *molestus* or *fatigans*. As mentioned above, *globocoxitus* and *molestus* may then interbreed but no *australicus* hybrids have been found.

2. *Sexual isolation.*—No mating preference exists between *fatigans* and *molestus*, or between the various strains of *molestus*. Between *molestus* and *globocoxitus* there is a one-sided sexual preference; males of *globocoxitus* inseminate females of both species indiscriminately, but *molestus* males ignore *globocoxitus* females. Between *globocoxitus* on the one hand and *fatigans* and *australicus* on the other, there is almost complete sexual isolation due to mating preferences.

The isolation of *australicus* from all the other members of the group is largely due to the fact that it is eurygamous; mating occurs in flight, and resting females, in cages, generally resist stenogamous males attempting to copulate.

3. *Mechanical isolation.*—This has been occasionally observed between *globocoxitus* males and *australicus* females. Coupling takes place with difficulty and some pairs are not able to separate.

4. *Gametic isolation.*—Males of *fatigans* and *molestus* will inseminate *globocoxitus* females, but the eggs, with few exceptions, fail to develop. Similar results were obtained in backcrosses of F1 males (*m g* and *f g*) with *globocoxitus*.

5. *Hybrid inviability.*—The few larvae which hatched from the *globocoxitus* × *molestus* crosses and from the backcrosses (*g* × *m g*) died in the first instar. The other notable example of hybrid inviability is seen in the crosses between *molestus* males of the Melbourne strain and females of the other strains, and of *fatigans*.

Many workers, in different parts of the world, have investigated crossbreeding between members of the *pipiens* group, particularly *pipiens*, *molestus* and *fatigans*. One of the most interesting results of this work is the discovery that, while crosses between these forms are commonly fertile, crosses between geographical strains of *molestus* may be partly sterile (Marshall, 1938; Roubaud, 1941, 1945; Ghelelovitch, 1952; Shute, 1953; Laven, 1951, 1953).

Laven, who has investigated this phenomenon in most detail, suggests that within *molestus* there may exist "several systematic units not yet recognised".

Laven explains the partial sterility between strains as an effect of the maternal cytoplasm, a view which Smith-White (1950) had previously put forward to account for results of crossings within the *Aëdes scutellaris* group. The basic features of these crosses, which have led to the application of the theory of the cytoplasmic factors, are non-reciprocal fertility and the sterility of backcrosses between hybrid males and females of the paternal form. The eggs either fail to develop or, if they develop, the larvae either do not hatch or are non-viable. It is believed that the egg cytoplasm is inimical to the genome of the other partner in the cross.

The results, recorded above, of crosses between the Melbourne strain of *molestus* and the other strains are in harmony with Laven's view. So also are the results of crosses: *Me* strain of *molestus* × *fatigans*, *molestus* × *globocoxitus* and *fatigans* × *globocoxitus*. However, in the first two of these, the reduced fertility in F1 crosses indicates that there is also some genic disbalance.

From these experiments it appears that the intensity of the cytoplasmic effect depends on the closeness of the relationship between the participants in the cross. When they are closely related (e.g., strains of *molestus*) the eggs develop but the larvae fail to emerge; the shell, a maternal tissue, is possibly a mechanical barrier. With more distantly related forms (e.g. *molestus* and *globocoxitus*) the eggs do not develop at all.

The analysis of isolating mechanisms and inter-fertility has shown that there are different levels of speciation within the *C. pipiens* group. *C. globocoxitus* is reproductively isolated; though closer to *molestus* than to *fatigans*, it is specifically distinct from both. Between *fatigans* and *molestus* there appear to be no isolating mechanisms and since they have been repeatedly recorded as interbreeding in nature and can establish independent hybrid populations they cannot be regarded as separate species.

The Victorian strains of *molestus* cannot be regarded as a complex of sibling species for, although there are some genetical differences between them, there is no sexual isolation; the strains would certainly interbreed in nature. It is more likely that *molestus* provides an example of the alternative situation postulated by Kitzmiller (1953). It appears to be undergoing rapid expansive evolution, but the genetical changes have not, as yet, been accompanied by detectable morphological and/or physiological differences.

One outstanding problem in the taxonomy of the *pipiens* group is the relationships of *molestus* and *fatigans* to *pipiens*, s. st. Some of the contradictions in the results of crossbreeding experiments between these forms can be attributed to a failure to make a distinction between the North American *pipiens* and the European. The opinion that

they must be treated separately (Dobrotworsky and Drummond, 1953, p. 135) is reinforced by the recent work of Micks (1954) on the paper chromatography of these forms.

Structure of C. globocoxitus hybrids.

Descriptions of *pipiens* × *fatigans* hybrids have been given by many workers (Weyer, 1936; Sundararaman, 1949; Rozeboom, 1951; etc.) and only *globocoxitus* hybrids will be described here. The F1 hybrids from crosses of *globocoxitus* and *molestus*, *fatigans* or *australicus* are structurally intermediate between the parent forms. This is most evident in the male genitalia because of its distinctive structure in *globocoxitus*. The coxites of the F1 hybrids are slightly swollen and the bunch of setae on the inner face is reduced. The rods and setae on the sub-apical lobe undergo a variety of changes, particularly in setae accompanying the leaf; seta *i*, which is present only in *globocoxitus*, is inherited only by *australicus* × *globocoxitus* hybrids. The shape of the mesosome is also important for distinguishing the hybrids.

The F2 generation consists mainly of intermediates, but a few specimens were similar to one or other of the parental forms. The results of backcrosses were similar except that there was a smaller proportion of intermediates.

Description of the adult hybrids.

molestus × *globocoxitus*.—The F1 males are intermediate. The length of the palps is variable; the shaft has long hairs as in *molestus*. The sub-apical lobe of the coxite bears three proximal rods (Text-fig. 2); the number of setae accompanying the leaf varies from one to three; the seta *i* is always single. The setae on the inner face of the coxite are few in number and short. The dorsal processes of the mesosome are variable; in some specimens they are like those of *globocoxitus*, in others the tip is rounded or has a small apical cavity. The number of hairs on each lateral lobe of the ninth tergite varies from four to fourteen with a mean of eight.

The females show more resemblance to *globocoxitus*. The abdomen is usually black above with wide basal bands; the lateral spots are usually duller than in *globocoxitus*. Patches of black scales on the venter are inconspicuous or absent.

The F2 consists mostly of intermediates; but some specimens are indistinguishable from the parental species.

molestus globocoxitus × *molestus*.—The offspring are almost identical with *molestus*, but some males have a few long hairs on the inner face of the coxites. One male was distinguished by very long palps; the first four segments were longer than the proboscis.

molestus × *molestus globocoxitus*.—The majority are intermediate. A few males are similar to *globocoxitus* and others have short palps as in *globocoxitus*, but genitalia identical with that of *molestus*.

fatigans × *globocoxitus*.—The F1 males are intermediate. The first four segments of the palps are shorter than the proboscis; the shaft has long hairs as in *fatigans*. The rods and setae on the sub-apical lobe of the coxites resemble those of *fatigans*. In the mesosome the dorsal processes are like those in *fatigans*, the ventral processes and the DV/D ratio are intermediate. Each lateral lobe of the ninth tergite bears four–six hairs.

The F1 females tend to resemble *fatigans*. The abdominal bands are usually more or less constricted laterally; on the venter patches of black scales may be present or absent.

The F2 tends towards *fatigans*; the male genitalia is similar, but in some the DV/D radio is intermediate. A few males are similar to *globocoxitus*.

fatigans globocoxitus × *fatigans*.—Variable but tending towards *fatigans*. A few males were similar to *globocoxitus*.

fatigans globocoxitus × *globocoxitus*.—Variable but tending towards *globocoxitus*. The ventral processes of the mesosome are intermediate. The abdominal bands in the females are usually wide, but in a few specimens are constricted laterally as in *fatigans*. On the venter, patches of black scales may be present or absent.

fatigans × *fatigans globocoxitus*.—The males are intermediate, but tend towards *fatigans*; in some the DV/D ratio is intermediate. The females are similar to *fatigans*.
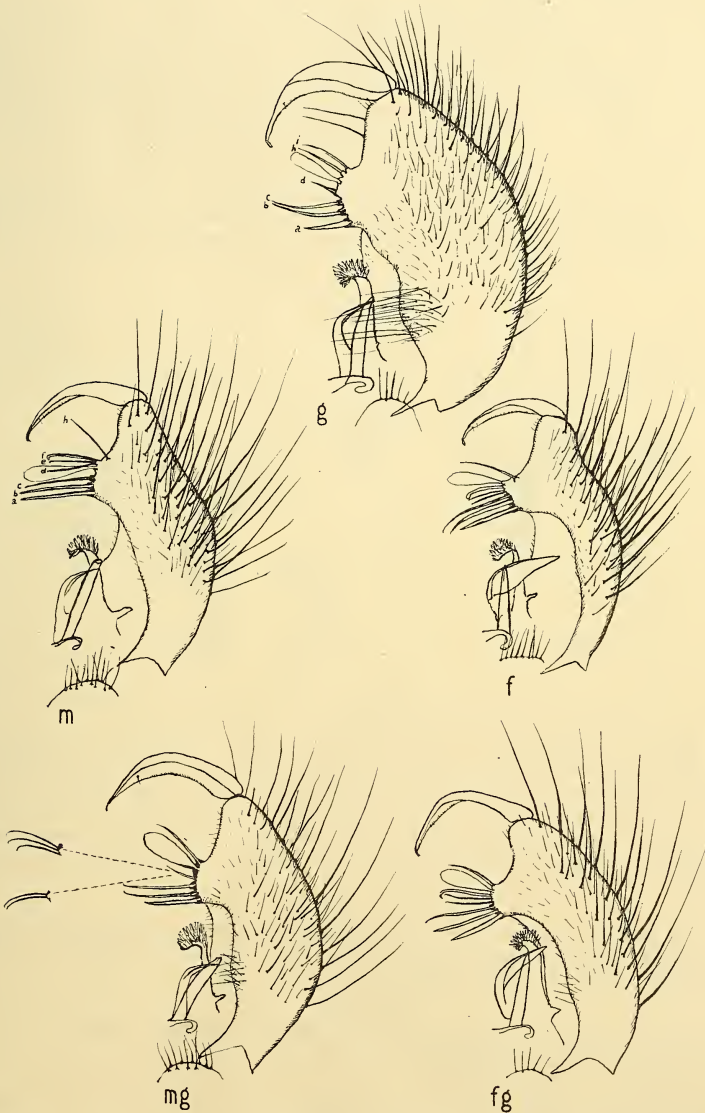
Text-figure 2.—Male genitalia. *g—globocoxitus, m—molestus, f—fatigans, mg—molestus × globocoxitus, fg—fatigans × globocoxitus; a-c—proximal rods, d-i—setae.*

australicus × *globocoxitus*.—The F1 is intermediate, but tends towards *australicus*. The male palps are similar to those of *australicus*, but the first four segments are shorter than the proboscis and the long hairs are less numerous. The genitalia are intermediate (Text-fig. 3); the sub-apical lobe of the coxites bears three proximal rods of which *a* is intermediate, while *b* and *c* are similar to those of *australicus*; the group of setae accompanying the leaf usually consists of two setae, though in one male this group was similar to that of *australicus*; the seta *i* is present as in *globocoxitus*. The dorsal processes of the mesosome are variable; the ventral processes are like those in *australicus*.

The proboscis of the females is usually pale ventrally; only two females had black scales ventrally at the tip. Only one female had postspiracular scales. The abdominal bands are variable; in some they resemble those of *globocoxitus*, but in most the bands are separated from the lateral spots on the second–fifth tergites, as in *australicus*. Patches of black scales on the venter are variable in size but always present.

Text-figure 3.—Male genitalia. *a*—*australicus*, *ag*—*australicus* × *globocoxitus*.

australicus globocoxitus × *globocoxitus*.—Intermediate. The first four segments of the male palps almost equal the length of the proboscis. The distal half of the shaft bears ten–fourteen long hairs. The coxite is similar to that of *globocoxitus*, but the hairs on the inner face are always shorter and less dense. The mesosome is intermediate.

The females are variable; some are intermediate, others are indistinguishable from *globocoxitus*. The patches of black scales on the venter are less prominent and may be absent.

Acknowledgements.

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A NOTE ON THE FAECAL FLORA OF SOME ANTARCTIC BIRDS AND MAMMALS
AT MACQUARIE ISLAND.

By J. S. Bunt,* Australian National Antarctic Research Expedition.

[Read 30th March, 1955.]

Synopsis.

An account is given of the aerobic bacteria found in the faeces of various antarctic birds and one mammal at Macquarie Island. *Escherichia coli* (Migula) Castellani and Chalmers was found in six species of birds and the seal elephant (*Morunga elephantina*). *Bacillus* and *Micrococcus* species were also fairly common. The faeces from single specimens of two avian species appeared to be completely sterile, possibly the result of microbial antagonisms within the rectum.

INTRODUCTION.

Since the inception of antarctic exploration, at least five expeditions have studied the bacteria of the alimentary canal, natural excretions and wounds of the various mammals, birds and fish which inhabit those regions. The first work of this nature appears to have been undertaken independently by Ekelöf (1908) and Gazert (1901–3). During 1903–5, Charcot collected further material which was examined by Tsiklinsky (1908). Later, McLean (1919) published the results of his studies from 1911–14 and Harvey Pirie (1912) his findings whilst with a separate expedition during the same period.

The results presented here were obtained from material gathered by the author as a member of the 1951–2 Australian National Antarctic Research Expedition to Macquarie Island. The only land mass in a vast expanse of ocean, Macquarie Island is most important as a breeding ground for seals, penguins and antarctic birds of flight. Approximately 24 species inhabit the island during the summer months. Of these, 16, including the most prominent types, have been used in this study. Bacterial isolates were obtained by normal plating techniques and maintained for further examination on return to Australia.

RESULTS.

A number of practical difficulties associated with unavoidably imperfect laboratory conditions at Macquarie Island resulted in the loss of many of the organisms originally isolated. The findings are summarized in Table 1. *Escherichia coli* was isolated from approximately half the species examined. No other types were found in the faeces of the seal elephant and the king penguin. Of the coliforms examined, five gave the reactions characteristic of *E. coli* type 1, and two gave those characteristic of *E. coli* type 2. The species of *Bacillus* isolated from the Royal penguin and the Gentoo penguin were morphologically and culturally identical. The diving petrel contained the most diverse faecal flora. No bacteria could be isolated from the faeces of the white-headed petrel or the dove-prion. The cultures placed under the general heading, "aerobic non-sporing rods", died out before they could be studied in any detail.

In addition to isolating faecal organisms, mixed cultures were prepared from wound pus and the mucous exudation from the nose of a bull seal elephant, but they did not retain their viability. However, smears were prepared from the original samples and also from the cultures when first isolated.

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In the pus smear were found Gram-negative rods, approximately $0\cdot7 \times 3\cdot0\mu$, usually occurring singly. Bacteria with the same morphology were also found giving a positive Gram reaction. Less frequently, small Gram-positive diplococci and Gram-negative, nonsporing rods, more than 10μ long and $0\cdot7\mu$ wide, were observed.

Infections of the nasal passages were found to be very prevalent. Small Gram-positive rods, Gram-positive micrococci and diplococci were common in mucus smears.

TABLE 1.

Bacteria Isolated from Faeces of Birds and Mammals at Macquarie Island.

Source.	E. coli Type.*		Bacillus spp. Gram Reaction.		Aerobic Non-sporing Rods.		Micrococcus.
	1	2	Positive.	Variable.	Gram-Positive.	Gram-Negative.	
Seal elephant (Morunga elephantina)	X						
King penguin (Aptenodytes patagonica)	X						
Royal penguin (Eudyptes schlegeli)	X			X			
Rockhopper penguin (Eudyptes cristatus)			X				
Gentoo penguin (Pygoscelis papua)				X	X	X	
Black-browed albatross (Thalassarche melanophris)					X		X
Giant petrel (Macronectes giganteus)	X				X	X	
Sooty shearwater (Puffinus griseus)			X			X	
Southern skua gull (Catharacta skua lonnbergi)		X	X				
Dominican gull (Larus dominicanus)		X				X	
Macquarie Island shag (Phalacrocorax albiventer purpurascens)					X	X	X
Grey duck (Anas superciliosa)			X			X	X
Diving petrel (Pelecanoides georgicus)			XX		X	X	X
Bar-tailed godwit (Limosa baueri)	X						X

White-headed petrel (Pterodroma lessoni) and dove-prion (Pachyptila desolata) : faeces apparently bacteria-free.
* Topley and Wilson (1946).

DISCUSSION.

McLean (1919) reported that *E. coli* had not been recorded from antarctic petrels either by himself or by previous workers, and hoped that the presence or absence of this organism might be established at some future date. The writer has isolated *E. coli* type 1 from the faeces of a giant petrel and an organism with the morphology and colonial characters of *E. coli* from a diving petrel. No bacteria were found in the faeces of a white-headed petrel. As the evidence available would suggest that *E. coli* is not an invariable constituent of the intestinal flora in any animal, it is probable that one should examine a number of specimens of any one species before concluding the general absence of coliform or any other group of organisms.

It is interesting to note that Oppenheimer and Kelly (1952) have isolated *E. coli* from the intestine of a wild sea lion (*Zalophus californianus*). Apparently they were

not aware of the earlier antarctic studies reviewed in this paper, since their examination was conducted especially to discover whether this organism might be present in marine mammals under natural conditions.

The reported sterility of the faeces from a number of antarctic birds and mammals is particularly interesting. For convenience, the results from several investigators are presented in Table 2. It will be seen that a wide range of species is reported to have no bacterial flora in the intestine. However, since seven of these species have also been found not to be sterile by one or more investigators, it does not follow that sterility of the faeces in one specimen is indicative of sterility in that species as a whole. Although

TABLE 2.
Faeces of Various Antarctic Birds and Mammals reported to be Bacteria-free.

Harvey Pirie (1912).	Gazert (1901–03).	Ekelöf (1908).	McLean (1919)	Bunt.
tern. cape pigeon. Wilson petrel. sheath bill.	tern. snow petrel. antarctic petrel. king penguin. *Priofinus* sp.	tern. Adelie penguin. gentoo penguin. cormorant.	tern. prion. silver-grey petrel. Ross seal.	dove prion. white-headed petrel.

it may be suspected that failure to obtain bacterial growth could be due to ineffective cultural treatment, the writer has collected some evidence to show that this may not always be the case, viz., the apparently bacteria-free faeces from a white-headed petrel were found to contain large numbers of yeast-like bodies or protozoa. These may have been causing the complete inhibition of bacteria, either by direct competition for nutrients or by the production of antibiotic substances. Unfortunately, it has not been possible to test this hypothesis. Certainly, it does not seem reasonable to assume that the absence of bacteria in the rectum could be due to a supposedly sterile, or almost sterile diet, as has been suggested in the case of certain antarctic birds by McLean (1919).

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CHROMOSOME NUMBERS AND POLLEN TETRAD SIZE IN THE WINTERACEAE.

By A. T. Hotchkiss, Department of Botany, University of Sydney.

(Plate i; five Text-figures.)

[Read 30th March, 1955.]

Synopsis.

The chromosome number of the four species of *Drimys* growing in New South Wales has been determined. Measurements of pollen tetrads from thirty-six species of the six genera of the Winteraceae are tabulated here. Centrifugal development of the stamens in *Drimys* is noted.

CHROMOSOME NUMBER.

There are six genera in the Winteraceae according to the recent treatment of this family by Smith (1943*b*). The Old World representatives of the genus *Drimys* all belong in the Section *Tasmannia* with about 36 species which extend from the Philippines through eastern Malaysia and eastern Australia to Tasmania. These are separated by Smith (1943*a*) from the American Section *Wintera* with four species scattered from Mexico to Cape Horn. Vickery (1937) reviewed the genus *Drimys* in south-eastern Australia, and described two new species and a new variety. Smith (1943*b*) recognized a total of six species in Australia—*D. membranea*, *D. insipida*, *D. purpurascens*, *D. stipitata*, *D. lanceolata*, *D. vickeriana*. The other five genera, *Belliolum*, *Bubbia*, *Exospermum*, *Pseudowintera* and *Zygogynum*, are found only in the Australasian area. Of these, only the genus *Bubbia* occurs in Australia.

Chromosome counts have been made on the four species of *Drimys* found in New South Wales. Herbarium specimens to be distributed have been collected for these four species. *D. lanceolata* was collected in the Mt. Kosciusko area, New South Wales, from plants growing on the slope between the road and the Snowy River about half a mile from Charlotte's Pass during January, 1954. A single count was made in the field camp. *D. insipida* was collected at Wentworth Falls, New South Wales, from plants growing near the lower falls during August, 1954. *D. stipitata* was collected in Rocky Creek Gully, Dorrigo, New South Wales, during September, 1954. *D. purpurascens* was collected at Barrington Tops, New South Wales, during October, 1954. Counts of the last three species were made on material brought back to Sydney from the field. All counts were made from smear preparations of pollen mother cells stained with aceto-orscin stain.

As shown in Table 1, the chromosome number for all the Australian species counted is $n = 13$, which indicates that these plants are diploid species and that 13 is the basic

TABLE 1.
Chromosome Number in the Winteraceae.

Species.	Section.	Meiotic Chromosome Number.	Somatic Chromosome Number.	Chromosome Count by.
DRIMYS $(n = 13)$				
D. insipida (R.Br.) Pilger	T	13	—	Hotchkiss, 1954.
D. lanceolata (Poir.) Baill.	T	13	—	Hotchkiss, 1954.
D. purpurascens Vickery	T	13	—	Hotchkiss, 1954.
D. stipitata Vickery	T	13	—	Hotchkiss, 1954.
D. Winteri Forst.	W	—	±76	Whitaker, 1933.